

# GMNP WILD POTATO COLLECTING TRIP REPORT

Guadalupe Mt Nat. Park (GMNP) and vicinity, Sept 14-21, 2007

Participants: John Bamberg (B), Alfonso del Rio (dR)

Concept: Site is isolated (no germplasm within 80-100 miles) and very few living collections (one *jamesii* previously collected by Bamberg, and no *fendleri*). For research, will compare *fendleri* to nearest others. Also compare DNA of collected leaves to that of seeds, thus comparing genetic capture in clonal vs seed collection. Provide herb specs for PTIS and local herbaria.

## Summary

*Preparations and parameters:* Funding by USDA/ARS/PEO (Appendix). Exploring southern escarpment required about 8 miles hiking with 35-40 lb. packs (4 miles to 2200 ft gain), and another 20 miles without packs on top, with 3 days / 2 nights wilderness camping (no fires allowed). As no water available on top, required arranging transport of 9 gallon water cache to top by local high school boys. Also searched 4 sites at northern part of the park requiring day hikes totaling about 16 miles. Permit and info from Fred Armstrong, natural resource director GMNP, also Ray Nance, Carlsbad HS biology teacher (see Appendix). Made map blown up to one page size and laminated with clear contact paper, showing trail names, lengths, camps. Gridded with degrees so points on map need only be annotated with decimal minutes for orientation with GPS (see Appendix). Flights to El Paso then rental car. Early, unusually heavy rainfalls, breaking 10-year local drought. Trails all well marked. See Appendix for previous herbarium site reports. Coordinates in decimals of minutes NxW in WGS84.

*Results:* Made three collections of *fendleri* germplasm in southern GMNP, first ever collected from Culberson county, of which one was previously reported (Burgess 2255, [1974]) and three new (not previously reported). Explored northern GMNP sites. Of these sites only found new germplasm at one previous herbspec record site (Powell and Sikes 1374 [1965]). This is the first *jamesii* germplasm from Eddy county. Could not find *jamesii* at site collected by B in 1996 (Bam 49 PI 595782).

Deposit of records and materials: US Potato Genebank, 4312 Hwy 42, Sturgeon Bay, WI, 54235. 920-743-5406. john.bamberg@ars.usda.gov. GRIN website. PTIS herbarium.

# TRIP LOG

## Friday, September 14

B departs 2 AM drive to ORD, meets dR for 10:20 AA flight to ELP. Rent Ford Mariner from Enterprise. Stop Peppy's Chicken for lunch. To GMNP visitor center, directed to Fred Armstrong's office. Get camp gas, permits, instructions. Back to visitor center for camping and parking permit. Check trailhead. To Carlsbad to lodge at Day's Inn. Called water carrier Santiago Chavez, arrange to meet at Chili's 6:45; mother Lucille, little brother, fellow student Huell White. Agree to meet 6:30 tomorrow Day's Inn.

## Saturday, September 15

Up 5:45 pack, breakfast, depart 6:30. Caravan to GMNP Pine Springs campground & trailhead (55 miles)—Santiago Chavez, Huell White, HeSung Park. Fill two 5-gallon collapsible water jugs (which at first wanted to leak at the spouts) and load into packs. Start up Tejas trail 8:15. At 11:00 Tejas/Bush trail jct (950x700 - 7835ft); at 11:30 Pine Top campsite #5 (139x756 - 8040ft), about 4 miles, 2200 ft gain. Huell & Santiago mention they like to hike "Dark" canyon just SW of Carlsbad—this was site remarked by Powell and Sikes 1374 (1965) which B assumed was a typo for "Dog". Eat lunch, set up camp, boys return. Find 15 gal. water cache at campsite #3. Lv 2:40 to explore Bowl trail. Good cell phone reception at high point about 20 min from camp at (931x560 - 7919ft) at clear outlook to E. E then N to jct with Juniper (530x763 - 7792 ft), arriving 4:30. Looked like good habitat. Back to camp 5:30. Afternoon hike about 8 miles. Cold night, probably in 40's.

## Sunday, September 16

Breakfast, leave 8:00 W on Bush trail. Top of ridge (625x737 - 8493 ft) at 9:00. At Bush Mt. Campground 9:20 (521x632 - 8393ft). Look here in likely spots on W-facing slopes around boulders with herbs. At 10:00 top of Bush Mt. at solar panels (788x765 - 8632 ft). At 10:20 descending N from Bush summit.

### COLLECTION #1

Lv collection #1 site at 11:05, proceeding N to jct Blue Ridge trail at 12:00 (869x735 - 8129ft).

### COLLECTION #2

Lv collection #2 site at 12:30 Ar Blue Ridge campsites (882x306 – 8209ft) at 12:45. Lunch at campsite #3. Continue at 1:30 to E on Blue Ridge. Reach Marcus trail jct (645x562 – 7668ft) at 2:09. Reach Tejas trail jct (711x289 – 7512ft) at 2:20 and continue S. From 2:40 to 3:00 in bottom of canyon to past Tejas campground (553x093 to 378x186 – 7300ft) in shady, appropriate habitat with large Douglas. Reach Juniper trail jct 3:20 (979x852 – 7418ft). Bush trail jct 4:25. E on Bowl trail to cell phone reception site to call home. Return to campsite. Just W of Bowl/Tejas/Bush jct (about 90 paces), see a few *fendleri* plants under one tree. Will collect tomorrow before descent. About 10 miles of trail and nearby likely sites searched today.

### **Monday, September 17<sup>th</sup>**

Cloudy threatening rain. Lv 7:40 to further explore Bowl. Reach Hunter peak at 8:50 (884x913 – 8268ft). Cell phone works here. Habitat looked good around boulders. Reach Bowl/Bear trail jct 9:25 (099x599 – 8007ft). At 9:30 large old water tank. At 10:00 reach Juniper trail jct. At 10:13 reach another large tank (441x159 – 7932ft). At 10:30 stop for snack (518x420 – 7700ft). From here, straight W cross country about ¼ mile to meet Tejas trail and follow it S back to jct. Of Bowl trails, meadow at jct with Juniper trail looked most favorable, and we searched here most extensively. Upon return to Bush/Bowl/Tejas jct, we also look extensively around area where *fendleri* now known to exist (i.e., collection #3). Find another box of water under a tree W of horse hitching rail. Back to tents at 11:30, break camp, leaving at about 12:30. Collect #3.

### **COLLECTION #3**

Lv collection #3 site at 1:00, descend to Pine Springs, Ar 2:40.

Report in at visitor center. Return to Carlsbad to lodge at Great Western Inn and Suites. Supper at Lucy's Mexicali restaurant.

### **Tuesday, September 18<sup>th</sup>**

Rise at 5:00 and to breakfast at Denny's. Drive S from Carlsbad about 7 miles to CR408 = Dark Canyon Road then S on 137 to (Upper) Dog Canyon Ranger Station, Ar 8:00. Look without success for *jamesii* to show Ranger Don Fischer. Meet Dave Holderman of TX Parks and Wildlife who was going down Tejas trail in Upper Dog canyon to scout for a rare quail. These he said are known to dig up and eat potato tubers, as he has observed in Sacramento Mts to the north. Start 8:50 W on Bush trail toward W Dog Canyon. Top Manzanilla ridge, a climb of about 800 ft and descend to W Dog Canyon valley where is

Bush/Marcus trail jct. Lunch and look for about two hours. Appropriate habitat, shady, moist along dry streambed, sometimes sandy, dark soil and thick needle mulch under spreading junipers. Description of Warnock 12051 (1954) "between Cox and Plowman tank" presumably near the canyon/streambed, could be anywhere along a two mile distance. If rare, we could have missed it (see Appendix). Return to Dog Canyon ranger station, talk with Don Fischer who reports that highlands of Guadalupe were once Angora goat range. Large tanks we saw held water pumped up from springs below. Elk migrated to N in search of water during drought years. Barbary sheep are present, a thriving non-native escape planted in TX for hunting (On Sept 31 Santiago Chavez sent email with picture of one they saw on descent). These, in addition to numerous deer we saw may have impacted potatoes (see Appendix). Looked hard around picnic tables and campsites in exact location where *jamesii* seen as abundant by B in 1996, but now no trace.

### **Wednesday, September 19**

Breakfast at Blue House Cafe. Stop at Guadalupe Park office in Carlsbad for Lincoln National Forest, Guadalupe district map and info to help ascertain where "SW portion of Dark Canyon" site described by Powell and Sikes 1374 (1965) might be. As "Dark Canyon" per se is marked on maps as extending from Dog Canyon NE for 20+ miles, that description could reasonably include the location of Upper Dog Canyon of multiple previous reports. Back down Dark Canyon road to 137. Look S of Queen (422x442 – 5884ft) under junipers. About 3 miles SW of Queen take gravel 504 E then S along W edge of cliffs of plateau. From 12:10 to 12:30 look just S of Fox Point Vista (606x560 – 6964ft). Good gravel of 504 ends at about N 02.50' at jct with 307, where we parked. Searched about ½ mile beyond to S on 504 and about 1 mile down 307, especially S of road in Middle Fork, Big Canyon streambed (622x768 - 7049ft). Return N up 504 to Klondike Gap Road 69 jct (~900x600) and S to park (865x381 – 6171ft) and look extensively up N-S Fir canyon streambed environs. Looked very good with moisture, Ponderosas, dark organic sandy soil. Cattle present. This is the place known particularly as "Dark Canyon" and is so marked by signs. Return to W and N but stop at 3:00 to look along N-facing cliff beside stream just before road turns N.

### **COLLECTION #4**

Return to White's City for supper then Carlsbad.

### **Thursday, September 20**

Up 7:00 to Blue House Cafe for breakfast w/fruit from Albertson's grocery. Check out of motel at 9:00. Drive S about 50 miles to GMNP headquarters area to road to McKittrick

Canyon. Start trailhead at 10:40 (060x132 – 5028ft) up McKittrick canyon. Looked at base of N-facing cliffs along streambed (193x815) similar to habitat at collection site #4. Look at likely spots to (149x517) about 2 miles from trailhead but only to about 5000 ft. Got wet in rainstorm. This trail follows the canyon only for about 3.5 miles to 5400 ft (probably too low), then climbs the ridge. Young s.n. (1916) *jamesii* gives no elevation, but if in McKittrick canyon per se, would more likely be found by searching where McKittrick Canyon crosses Tejas trail just N of Tejas campground (7400 ft) and down (E) in the streambed. This upper McKittrick canyon bottom close to Tejas trail *was* searched on Sunday, September 16 by B and dR. Could Young s.n. be N McKittrick canyon in NM, much higher?

To Dell City to look at site of Correll and Johnston 24322 (1961). This site is confused. Description says Hudspeth Co, TX and Black mountain of Cornudas range. Black mountain of Cornudas range is just over the New Mexico border. The “town” of Cornudas is on 62/180 just W of the jct of ranch road 1111. About 25 miles SE of Cornudas are the Black mountains, the highest peak of which is less than 5500. While Black mountain in NM is only about 5200, Wind mountain, about 2 miles to the SW is over 7200. We asked Judge Juanita Collier at city hall in Dell City who gave us phone number of reputed owner, Bobby & Pat Jones 915-963-2314 whom we were not able to reach. On the other hand, Fred Armstrong got us number of Tim Stewart ranch 915-964-2596, but directions to this ranch were to Black Mountain in TX. However, foreman at ranch claims half of Black mountain is owned by U of Texas, which suggests this might actually be the true site, since Correll worked for U of Texas. Should talk with Richard Worthington at UTEP or elsewhere about ideas on where this collection was most likely made. Tried to get close to Cornudas Mts in NM, but map was not accurate and dwindled to dirt tracks. Looks like access from 62/180 farther W might be best. Later checked website of New Mexico Wilderness Alliance which has directions for hikes: <http://nmwild.org/places/chihuahuan-desert/greater-otero-mesa-crow-flats>. This indicates that access is best from farther W:

To reach the southwest portion of the complex, take Highway 180/62 east from El Paso. Go about 19 miles past the Loop 375 intersection and turn left (north) onto Hueco Ranch Road, just west of the Border Patrol check point. Travel north, then northeast on this gravel road for about 12½ miles before crossing into New Mexico. Here the road becomes CR F001. As you continue to the northeast on CR F001 from the state line, the Otero Mesa, Otero Mesa South, Otero Mesa East, and Shiloh Draw units lie to the northwest of the road, and the Prairie Dog and Otero units lie to the southeast. CR F018 intersects CR F001 about 20 miles from the state line and heads to the southeast to access to the units in the Cornudas Mountains.

Continue to El Paso and lodge at Travelodge. Wash clothes, pack up, get cardboard carrying box for live plants on plane. Depart ELP to ORD. Arrive ORD 5:00, Lv parking at 6:00. Traffic congestion of Friday PM causes trip home to take an extra hour; Ar 11:00 PM.

## **APPENDIX**

### **Ideas for subsequent work at the site**

Other high N-facing slopes of Guadalupe (8650ft), Shumard (8515ft), El Capitan (~7800ft) or Bartlet (8440ft) peaks should also provide good hunting for potato if they were as accessible by trail as is Bush.

One could test to see if goats particularly like wild potato—as the Angora goats Don Fischer said were ranched on top before the area became a national park, or the non-native Barbary sheep.

Test GMNP collections for genetic relationship to closest other collections (Sacramento, Franklin, Davis, Organ mountains).

Where potatoes are as rare as for this trip, two searchers seemed inadequate. After spots like W Dog Canyon have been scouted to map likely habitats, one would like to recruit, train and organize many amateur botanists in a large posse to thoroughly search those sites. This, and/or the advantage of dogs comes to mind as Dave Holderman uses these to scout quail. Could they be trained to find rare wild potato plants by smell, or even tubers underground as for truffles?

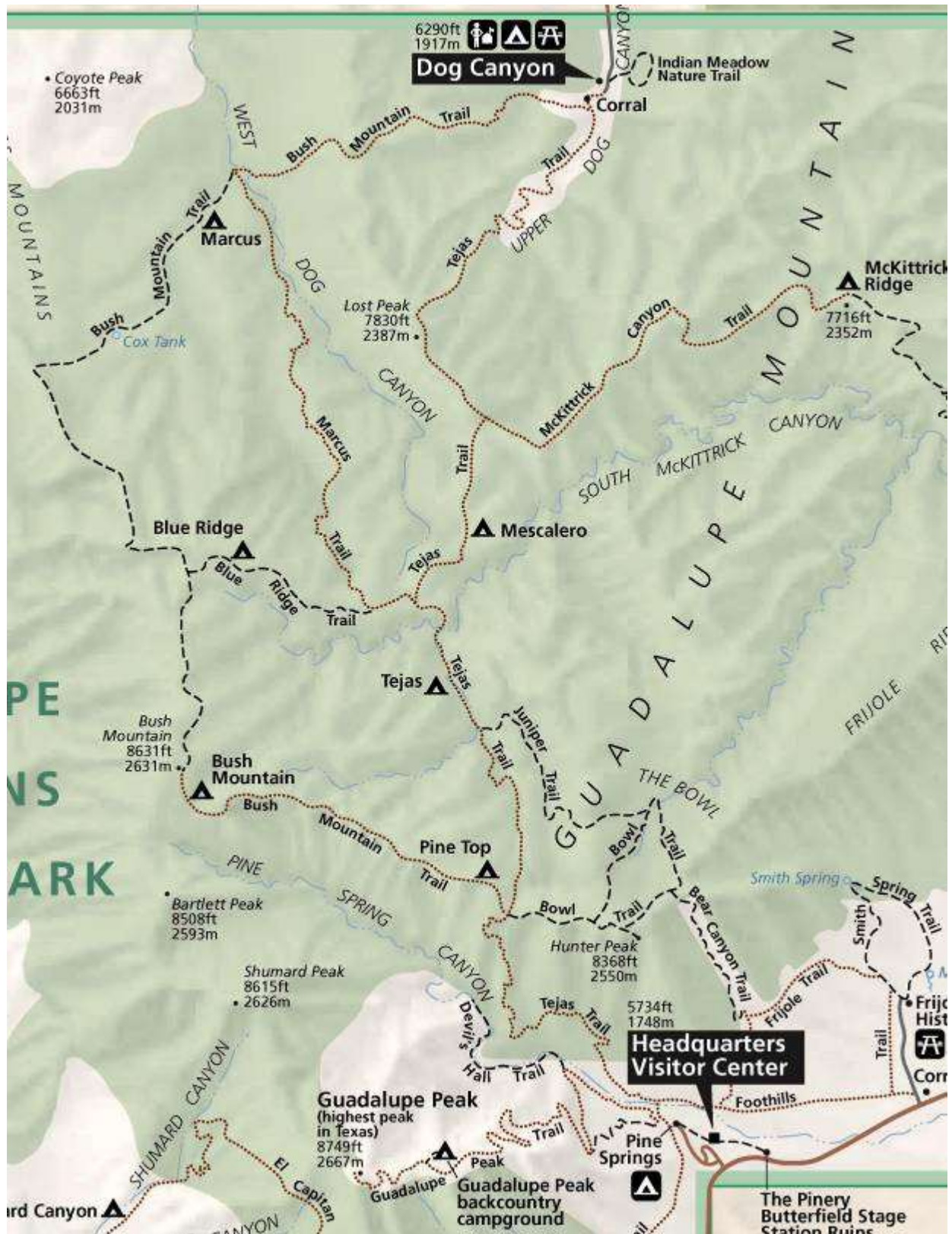
## COLLECTIONS LIST

Sept 14-21, 2007.

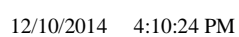
SW07 Coll No	BdR Coll No	WGS84 Lat min N of 31E in TX, N of 32E in NM	WGS84 Lon min W of 104E	Elev (ft.)	Location Description narrative <sup>1</sup>
1	159	55.862	52.789	8490	#1. <b>PI 651526, BdR 159.</b> <i>S. stoloniferum</i> . Texas. Culberson County. Guadalupe mts. Sept 16, 2007. At N31E55.862' x W104E 52.789' and 8490 ft. North slope of Bush Mountain on Bush trail. Vicinity Burgess 2255 [1974]. Along trail between summit and where trail passes lookout to W with cliff face to the NW. Under Gambel oak and brush shade in dark leaf mulch soil and rocks. About 100 plants, most spindly, up to 10 cm, no flowers, fruit rare, mature tubers shallow between leaf cover and soil. Collected 7 fruit (590 original seeds), and leaves for DNA; photos.
2	160	56.880	52.730	8100	#2. <b>PI 651527, BdR 160.</b> <i>S. stoloniferum</i> . Texas. Culberson County. Guadalupe mts. Sept 16, 2007. At N31° 56.880' x W104° 52.730' and 8100 ft. Very close to jct of Bush and Blue Ridge trails. Under only one large juniper in a broad grassy meadow. About 12 plants up to 10 cm in dark soil under needle mulch, no flowers, one fruit. Collected 1 fruit (62 original seeds) and leaves for DNA; photos.
3	161	56.880	50.727	8750	#3. <b>PI 651528, BdR 161.</b> <i>S. stoloniferum</i> . Texas. Culberson County. Guadalupe mts. Sept 17, 2007. At N31° 55.002' x W104° 50.719' and 8750 ft. About 250 ft NW from Tejas/Bowl/Bush trail jct, under only one juniper about 20ft N side of trail. Ten plants in needle mulch up to 10 cm, no flowers or fruit, Collected 3 tubers, 1 plant, leaves for DNA; photos.
4	162	05.799	45.988	6200	#4. <b>PI 651529, BdR 162.</b> <i>S. jamesii</i> . New Mexico. Eddy County. S of Carlsbad on 62 about 7 miles to CR408 = Dark Canyon Road then S on 137 past Queen 3 miles to gravel 504 about 4 miles to Klondike Gap road 69. At 1.6 miles S on Klondike Gap road. Vicinity Powell and Sikes 1374 [1965]. At base of N-facing cliffs that run beside stream where road turns E. At N32° 05.799' x W104° 45.988' and 6200 ft. Red sand in shade of junipers very close to cliff face. About 15 healthy, light green plants to 20 cm. No flowers or fruit. Collected 5 tubers and 6 plants; photos.

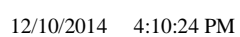
<sup>1</sup> *stoloniferum* previously known as *fendleri*.

OFFICAL GMNP SITE MAP









## PICTURES



N side of Bush Mt. collection #1, BdR 159 *fendleri*



Bush – BlueRidge trail jct collection #2, BdR 160  
*fendleri*



Dark Canyon collection #4, BdR 162  
*jamesii*



Huesung Park, Huell White, Santiago Chavez, Alfonso del Rio at  
Pine Top campsite #5



A. del Rio on escarpment with view S to Guadalupe Peak



J. Bamberg on Bush Mt trail

## **Ad hoc GERMPLASM COLLECTING PROPOSAL**

John Bamberg, US Potato Genebank, June 20, 2007

Target species: *Solanum jamesii*

Area: West TX / NM border – Guadalupe Mts., USA

Time: Mid-late Sept, 2007 (depending on local conditions)

Duration: about 8 days, total

Background: There are only three *jamesii* sites in the target area. The first, near El Paso has been adequately collected. The second, known only from a herbarium record of 1961 is from one of the five peaks in the small, isolated Cornudas range (NM) and has never been collected. The third site is the Guadalupe range (accessible in about a 7-mile square of trails in the Guadalupe Mountains National Park). Germplasm has been found and collected only from one drive-up location in GMNP, although habitat throughout the park should be appropriate.

Objectives: a) Explore and sample Cornudas range peaks, b) Explore and sample multiple sites in GMNP. Benefits: add novel germplasm to USPG, and for b), acquire material for research testing the representativeness of easy-access samples (to compliment similar collecting of *fendleri* in 2004-2006 in AZ sky islands).

Itinerary: Fly to Tucson, drive to trailheads, hike, camp and collect along trails.

Participants (US Potato Genebank employees): John Bamberg (USDA/ARS), Charles Fernandez and Alfonso del Rio (University of Wisconsin)

Funding: Travel for 3 at ca. \$3,000 total.

Contingency plans: There are four important reasons to return to the vicinity of Sierra Vista, AZ. Although the crest of the Huachucas were collected in 2005, Huachuca Peak itself, which stands apart across a 5-mile gap remains unexplored. The Canelo Hills, just west of the Huachucas could also be explored (very few reports from this remote area). We would like to sample and identify the organism that causes fruit galls on potato uniquely observed in this area. We would like to investigate a *jamesii* site which recently came to my attention (very near Sierra Vista city) which, if validated, would be the lowest reported wild potato in the US (4100 ft).

## PREVIOUS REPORTS

Collector	Col No	sp	Herb	ST	Area	Site	hab	date
Bailey	456	sto	US	TX	Guad	Guadalupe Mountains		August 23, 1901
Burgess	2255	sto	TEX	TX	Guad	Culberson County, Guadalupe Mts. Nat'l. Park, N side of Bush Mt.	mostly on valey floor and nearby slopes	August 2, 1974
Burgess & Nothingham		jam	TEX/NM	TX	Guad	Upper Dog Canyon (Ranger Station) near TX/NM line		1981
Burgess & Nothingham		sto		TX	Guad	Upper Dog Canyon (Ranger Station) Streambed		1981
Nothington	931	sto		TX	Guad	Upper Dog Canyon (Ranger Station)		
Powell and Sikes	1374	jam	ARIZ, TEX	NM	Guad	Guadalupe Mts., SW portion of Dark Canyon	growing on a slope in sloughed bark and humus rich soil	September 1, 1965
Warnock	12031	jam	LL, SRSC	TX	Guad	Culberson County, between Plowman Tank and Cox Tank, N Guadalupe Mts. near W Dog Canyon	limestone soil	September 5, 1954
Warnock	21664	jam	SRSC	TX	Guad	Culberson County, near ranger station, W Dog Canyon Area	limestone soil	Aug 11-15, 1981
Young	s.n.	jam	SRSC, TEX	TX	Guad	McKittrick Canyon, Guadalupe Mts.		August 29, 1916
Correll and Johnston	24322	jam	F, LL, MO, NY, SMU, UC	NM	Corn	Hudspeth County, Black Mountain of the Cornudas range <b>[NO... this is in New Mexico?]</b>	lava-rock slopes, in loamy soil, north slope	September 8, 1961
Bamberg	49	jam	PTIS	TX	Guad	Culberson County In Guadalupe National Park. Around campsites and picnic area along creek just S of ranger station.	In shade around picnic tables and campsites and among grass along W creek banks. In moist dark humus soil.	August 1, 1996



## CONTACTS

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